

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D: 20 OCT 2004

WIPO PCT



Applicant's or agent's file reference 4/W32631WO	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/GB 03/03213	International filing date (day/month/year) 29.07.2003	Priority date (day/month/year) 14.08.2002
International Patent Classification (IPC) or both national classification and IPC H04B7/06		
Applicant UNIVERSITY OF SURREY et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 7 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 12.03.2004	Date of completion of this report 18.10.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Schreib, F Telephone No. +49 89 2399-7114 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/GB 03/03213**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-5 as originally filed

Claims, Numbers

1-9 as originally filed

Drawings, Sheets

1/1 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 8,9

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 8,9 are so unclear that no meaningful opinion could be formed (*specify*):

see separate sheet

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos.

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the Standard.

☐ the computer readable form has not been furnished or does not comply with the Standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	2,3
	No: Claims	1,4-7
Inventive step (IS)	Yes: Claims	
	No: Claims	1-7
Industrial applicability (IA)	Yes: Claims	1-7
	No: Claims	

2. Citations and explanations

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see separate sheet

Re Item III

1. The term "substantially as herein described with reference to the accompanying drawing" used in claims 8 and 9 is vague and unclear and leaves the reader in doubt as to the meaning of the technical features to which it refers, thereby rendering the definition of the subject-matter of said claims unclear (Article 6 PCT). Therefore no meaningful opinion could be formed.

Re Item V

2. Reference is made to the following documents:

- D1: WO 92 10890 A (QUALCOMM INC) 25 June 1992 (1992-06-25)
- D2: US 4321605 (Hazeltine Corporation) 23 March 1982 (1982-03-23)
- D3: Channel resource allocation/reallocation in cellular communication and linear programming, 003 IEEE INTERNATIONAL CONFERENCE ON SYSTEMS, MAN AND CYBERNETICS. SMC'03. CONFERENCE PROCEEDINGS. WASHINGTON, DC, OCT. 5 - 8, 2003, IEEE INTERNATIONAL CONFERENCE ON SYSTEMS, MAN, AND CYBERNETICS, NEW YORK, NY : IEEE, US, ISBN 0-7803-7952-7, VOL. 5 OF 5, pages 2983-2989, XP10668073
- D4: Introduction to Algorithms, Thomas H. Cormen, Charles E. Leieron, and Ronald L. Rivest, 1990, The MIT Press, page 814

The documents D2-D4 were not cited in the international search report. Copies of the documents are appended hereto.

3. The applicant states in his letter dated 6.9.2004, that a group must have at least 2 elements to be considered as a group. Analysis of technical literature in the field of antennas, communications and algorithms shows that "one element groups" exist in technical literature.

Document D2, which lies in the field of antennas, mentions in col. 5, lines 50-54 antenna groups comprising one element.

Document D3, which lies in the field of cellular communication, mentions on page 2989, left column, second paragraph "create a group (i.e. a group of one element)" also "one element groups".

Looking at the mathematical definition of a group as it can be found in D4, page 814, section "finite groups" one can see that a group can comprise only a single element. If one takes the zero element it meets the requirements of closure, identity, associativity and inverses. Therefore a group with one element exists.

If a group had to have at least 2 elements then additional clarity problems would arise for claim 1. If the antenna arrangement comprised 3 antennas (one possibility for a plurality of antenna elements) it would not be possible to arrange the antenna elements in 2 groups as one group would have only one element. On the other hand claim 1 assumes that one always can arrange a plurality of antennas, which can be 2 antennas, in at least two groups as the word group is used in plural form. Therefore claim 1 is not clear if a group also can consist of one element.

Having all these arguments in mind the examiner stays at his opinion that a group also can consist of a single element. Therefore the arguments in the communication dated 6.4.2004 still are valid.

4. Independent claims 1 and 6 do not to meet the requirements of Article 33(2) PCT for the following reasons:

4.1 Document D1 (the references in parentheses applying to this document) discloses as in claim 1:

A wireless communication system including a mobile station and a base station having a distributed antenna arrangement (*see abstract*) comprising a plurality of antenna elements for producing antenna signals across an area of coverage of the distributed antenna arrangement (*see page 17, lines 30-32 and Fig. 2*), wherein said antenna elements are arranged in groups (*see Fig.1: A group can consist of only one element. In Figure 1 the antenna elements 28 are arranged in groups of one element having different delay times*), antenna elements producing the strongest antenna signals at the mobile station, within at least part of said area of coverage, are assigned to different said groups (*this condition is automatically fulfilled if only groups with 1 element are formed like in D1*) and antenna signals produced by the different groups of antenna elements are subjected to preset relative delays (*see Fig.1 references 30A, 30B, .. 30J and page 9, lines 5-7*) enabling the antenna signals to be combined substantially coherently in the mobile station

(see page 19, lines 13-16).

Hence all the features of claim 1 are disclosed by D1.

- 4.2 The subject-matter of claim 6 discloses the method corresponding to the apparatus of claim 1. Therefore the above argumentation also applies to this claim.
5. The subject-matter of claims 2 and 3 does not meet the requirements of Article 33(3) PCT. D1 shows on page 18, lines 17-20 that for each path with different delay a RAKE receiver with a finger for each path is used. Therefore it is obvious for the person skilled in the art, that for N paths N fingers should be used. N=3 is only one case whereby the selection of N=3 is an ordinary design measure which is obvious for the person skilled in the art.
6. The subject-matter of claim 4, 5 and 7 do not meet the requirements of Article 33(2) PCT. Fig. 1 of D1 shows one group with antenna 28A which has no delay. The feature of claim 5 automatically is fulfilled for a group with one element.